

SECTION 2 - IMPACTED WATER SYSTEMS

2.0 INTRODUCTION

Based on the data obtained from ADEQ, all the water systems in Arizona were classified into different sizes on the basis of average population served. Systems serving less than 10,000 persons were classified as small water systems and those serving greater than 10,000 people were classified as large water systems. Small water systems were further classified into three categories based on population ranges of 0-500, 501-3,300 and 3,301-10,000. The breakdown of POEs impacted by the 10 ppb arsenic standard (on an average concentration basis), by system size, is shown in Table 2.1. Table 2.2 shows the details of System ID No., system size, POE identification number and average arsenic concentrations for the impacted small groundwater systems. The same information for large groundwater systems is shown in Table 2.3. Although the focus of the AMP is on small groundwater systems serving less than 10,000 people to identify funding and implementation needs, the information presented herein is also useful for large groundwater systems.

Table 2.1: Summary of System Sizes and Impacted POEs (groundwater)

SYSTEM SIZE	NUMBER OF IMPACTED POEs
Large systems - breakdown of impacted POEs by size	
>10,000 - 50,000	95
>50,000 - 100,000	21
>100,000	104
	220 Total Large System POEs
Small systems - breakdown of impacted POEs by size	
0-500	231
>500 - 3,300	151
>3,300 - 10,000	91
	473 Total Small System POEs
Total All Systems	793 Total POEs

Table 2.1 indicates that 60% of all impacted POEs belong to systems serving fewer than 10,000 persons. Further, 29% of all impacted POEs belong to systems serving fewer than 500 persons, or very small systems. All systems shown above are groundwater systems. A small number of surface water systems are impacted by the 10 ppb arsenic standard, as shown in Table 2.4. Assuming these systems have the capability to add a coagulant, flocculate and filter, the existing treatment systems in place at these utilities can be optimized for arsenic removal. Some additional field investigations may be required to confirm this. As such, no significant capital cost impacts are anticipated for these small surface water systems.

2.1 MCL COMPLIANCE CRITERIA

Arsenic sampling results from 1993-2001 were obtained for all public water systems in the State from the ADEQ drinking water database. The following statistical methods were utilized to determine which systems were impacted by the 10 ppb standard.

Method 1: Average arsenic levels greater than 10 ppb (priority systems)

Method 2: Single maximum arsenic sample greater than 10 ppb

Method 3: Single maximum arsenic sample greater than 8 ppb and less than 10 ppb.

Depending on which method is used, the number of impacted systems varies as discussed below.

2.1.1 Method 1: Average Arsenic Levels Greater Than 10 ppb

POE sampling data collected from 1993 onwards from the ADEQ database was analyzed and the average arsenic concentration for each system was calculated on a POE basis. Systems with average arsenic concentrations exceeding 10 ppb were identified and tabulated as shown in Table 2.2. It was observed that systems with approximately 473 POEs had average arsenic concentrations exceeding 10 ppb. These systems were given highest priority and the average values for these POEs were used for developing the cost impacts in the Master Plan. They are anticipated to require mitigation to comply with the standard.

2.1.2 Method 2: Single Maximum Arsenic Levels Greater Than 10 ppb

POE sampling data obtained for 1993-2001 from the ADEQ database was analyzed and systems with single maximum arsenic concentrations exceeding 10 ppb were identified. A comparison of average and maximum arsenic concentrations for each POE showed that 40 systems which did not exceed the arsenic MCL on an average basis exceeded the MCL on a single maximum value basis, as shown in Table 2.5. These systems were given the second highest priority and additional sampling is required at these POEs to assess if arsenic mitigation is required. Costs presented in the AMP do not consider the systems. Once the additional sampling is conducted, cost estimates can be developed for these systems.

2.1.3 Method 3: Single Maximum Arsenic Levels Greater Than 10 ppb and Less Than 8 ppb

POE sampling data from 1993-2001 from all DEQ wells was analyzed and systems with single maximum arsenic concentrations greater than 8 ppb and less than 10 ppb were identified. It was observed that systems with approximately 204 POEs had single maximum arsenic concentration greater than 8 ppb and less than 10 ppb. These systems are shown in Table 2.6. Additional sampling is required at these POEs to determine the average arsenic concentrations exceeding 8 ppb and to assess if arsenic mitigation is required. These systems may elect to install treatment as a precaution but will not likely be required to do so to comply.